Remarks

Reconsideration and reversal of the rejections expressed in the Office Action of December 18, 2003 are respectfully contended in view of the following remarks and the application as amended. The present invention relates to an organic waste material treatment process for organic waste material received in a vessel

Claims 54-62 were objected to under 37 CFR 1.75(c). The claims as clarified overcome this objection.

Claims 45, 46, 48 and 49 were rejected under 35 U.S.C. 102(b) as being anticipated by Cotton, U.S. Patent No. 4,565,552. Cotton describes its vessel as being made of concrete, metal or other impermeable and pressure-resistant material. Applicant respectfully contends that it cannot be inferred that the reference vessel is pressurised or able to operate and maintain an internal air pressure above atmospheric air pressure. Rather, the vessel described in Cotton is merely constructed to be water tight. Indeed, at column 5, lines 57 to 68 of the reference, it is described that under certain operating conditions gas may escape into the atmosphere by passing under flanges 7 of lid 6 of the vessel. Thus, Applicant submits that Cotton provides no anticipation for an air-tight pressurised vessel in which the sequential anaerobic digestion and aerobic composting process for treatment of organic waste material of the present invention can be operated. Claim 45 has also been clarified to overcome this rejection.

Claims 45, 46, 48 and 53 were rejected under 35 U.S.C. 102(b), and claims 49-52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isman, FR 2288719. Applicant respectfully contends that Isman does not disclose an air tight pressurised vessel in the sense that a person skilled in the art will understand to mean as "air tight" and "pressurised".

Firstly, the tank described in Isman is provided with a movable cover 10 provided with a water seal 11 which would not be able to withstand and maintain prolonged periods of internal operating pressures above atmospheric pressure. Indeed, the purpose of the tank of Isman is quite different. One of the advantages of the invention as described at e.g., page 3, lines 13 to 19

is to obtain a porous medium in which excellent aeration of the contents can be readily produced in the course of the pre-fermentation phase, thanks to the very large surface area in contact with air that is constantly being renewed and easily circulated across the porous mass.

Applicant respectfully contends that in Isman, air circulation in the tank is not achieved by providing an air tight pressurised vessel but by circulation an ingress of air through line 7 into the lower compartment 5 of the tank, through the contents of the tank, to an egress of air through line 27. The operation and maintenance of internal air pressures in the tank is not envisaged in Isman; the tank is merely constructed to circulate air through the tank's contents and accommodate and contain any rise in internal pressure generated by methanogenesis.

Furthermore, Applicant contends that the vessel in Isman is not intended to be used for pressurised aeration, i.e., circulation of air through the contents of the vessel does not amount to pressurised aeration.

Claims 50 to 52 have been amended to clarify that pressurised air is introduced to the vessel in order to obtain an internal operating pressure that is above atmospheric pressure such that the contents of the vessel are evenly penetrated by air.

In the present invention, pressurised air is supplied to the air tight pressurised vessel to maintain internal operating pressures. The vessel itself becomes pressurised and is constructed to withstand and maintain the defined pressures.

The present invention exploits the fact that a pressure differential between an area of low pressure in the organic material and an area of high pressure in the vessel is formed when air is first delivered to the vessel. The pressure differential so formed changes to equilibrate and so evenly distributes the air amongst the contents of the vessel. The period of time for equilibration will vary depending on the bulk density and permeability of the contents.

In contrast, the prior art system relies on air circulating through the material as it is pumped into the tank. Air delivered in this way will only take the path of least resistance, and may not penetrate material with high bulk density and low permeability.

Claim 47 was rejected under 35 U.S.C. 103(a) as being unpatentableover Isman. This claim has been deleted.

Claims 1, 3, 6 to 10, 13 and 17 to 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cotton in view of Sherman (US 2,337,686).

Applicant has amended claim 1 to further define the process of the present invention, wherein the first step of the process involves subjecting the contents of the vessel to conditions under which aerobic composting of the contents of the vessel will proceed in order to raise the temperature of the contents of the vessel to at least 50°C to promote anaerobic digestion of the contents. This preliminary aerobic composting stage is then followed by step (b) which can be described as an "anoxic stage" in which oxygen is depleted in the vessel.

Oxygen depletion is achieved by sealing the vessel and ceasing to pump and/or circulate air through the feeder lines 26 and the control line 28 to the vessel 20. Oxygen levels will eventually be depleted in the sealed vessel 20 by action of the aerobic bacteria therein. Only when the oxygen levels in the vessel 20 are sufficiently depleted is the anaerobic digestion stage of the process commenced (see page 15, lines 20 to page 16, line 2).

As noted at the specification at page 16, lines 3 to 15, depletion of oxygen inside the vessel prior to addition of an anaerobic inoculum and the commencement of the anaerobic digestion stage must occur to avoid the possibility of forming a combustible mixture of methane and oxygen in the vessel 20 once the anaerobic digestion stage starts.

The depletion of oxygen in the vessel before commencement of the anaerobic digestion stage is neither taught nor suggested in Cotton. Cotton merely describes an immediate transition from an aerobic milieu to anaerobic conditions within the vessel. No time period is provided for

in which to deplete oxygen levels in the vessel before the anaerobic digestion stage is commenced. Accordingly, a combustible and potentially explosive mixture of oxygen and methane within the vessel is afforded by Cotton.

Claim 1 of the present invention defines an intermediate anoxic stage (step (b)) between the preliminary aerobic composting stage and the anaerobic digestion stage, in order to prevent the formation of any combustible gaseous mixtures within the vessel 20.

Furthermore, the process of the present invention defines further stages in which gaseous by-products are separated from residues resulting from step (d) (step (e)) before air is again administered to the vessel, so as once again to avoid a combustible gaseous mixture within the vessel.

With respect to the Examiner's comments in the Office Action regarding claims 7 to 9 and 17 to 19, as previously discussed, the prior art references do not render obvious the use of an airtight pressurised vessel whose function is specific to the process of the present invention, in particular to the means by which air is evenly distributed to the contents of the vessel, regardless of the bulk density or porosity thereof.

The present invention exploits the fact that when the vessel is pressurised and internal operating pressures of greater than atmospheric pressure are maintained therein, a pressure differential between an area of low pressure in the organic material and an area of high pressure in the vessel is initially formed. With time, the pressure differential equilibrates and thus, evenly distributes the air amongst the contents of the vessel.

While the prior art citations may blow or circulate a positive pressure of air, the air will flow through a path of least resistance. Accordingly, the air is not <u>evenly</u> distributed amongst the contents of the vessel in the prior art processes to the same degree that is envisaged and achieved by the process of the present invention.

Claims 23, 25, 28-32, 35 and 39-44 were rejected under 35 U.S.C. 103 as being unpatentable over Cotton in view of Sherman taken further in view of Deneche. This rejection is overcome based on the above discussion.

For all of the above reasons, it is respectfully contended that the solicited claims define patentable subject matter. Reconsideration and reversal of the rejections expressed in the Office Action of December 18, 2003 are respectfully submitted. The Examiner is invited to call the undersigned if any questions arise during the course of reconsideration of this matter.

Respectfully submitted,

Date: 6/16/04

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